Planetary Science Division Overview

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Director, Planetary Science
October 6, 2011

NASA's Year of the Solar System Events

It's about a Mars Year (687 Earth days)

2010

- September 16 – Lunar Reconnaissance Orbiter in science mode
- November 4 - EPOXI encounters Comet Hartley 2

2011

- February 14 - Stardust NExT encounters comet Tempel 1
- March 7 – Planetary Science Decadal Survey released
- March 17 - MESSENGER orbit insertion at Mercury
- May 5 - Selection of 3 Discovery-class missions for study
- May - Selection of the next New Frontier mission for flight, OSIRIS-Rex
- July 16 - Dawn orbit insertion at asteroid Vesta
- August 5 - Juno launched to Jupiter
- August 9 - Mars Opportunity Rover gets to Endeavour Crater
- September 10 - GRAIL launched to the Moon
- November 25 - Mars Science Laboratory launch to Mars
- December 31 - GRAIL-A orbit insertion at Moon

2012

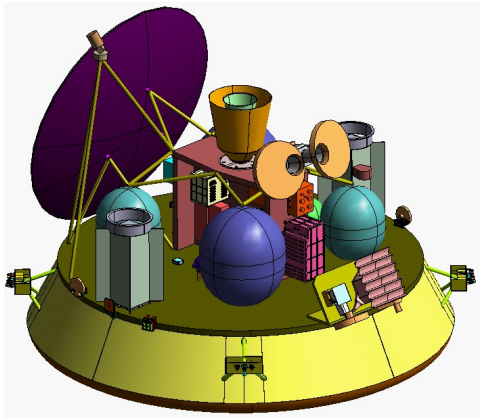
- January 1 - GRAIL-B orbit insertion at Moon
- Mid-year - Dawn leaves Vesta starts on its journey to Ceres
- August – Curiosity Rover lands on Mars

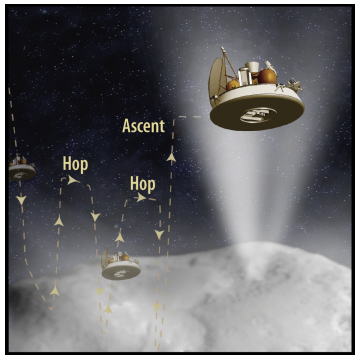
• Completed

http://solarsystem.nasa.gov

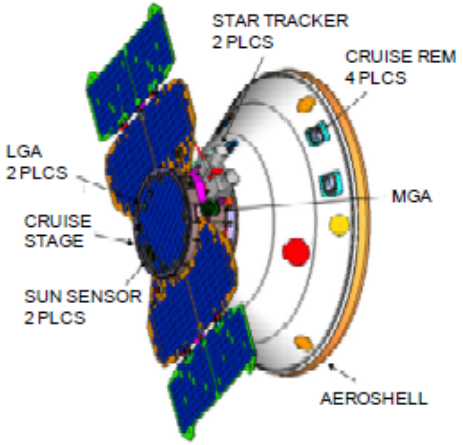
Next Discovery Mission – Candidate Studies

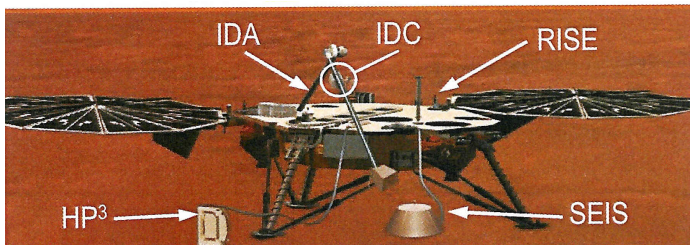
CHopper: Comet Hopper
PI: Jessica M. Sunshine UMD



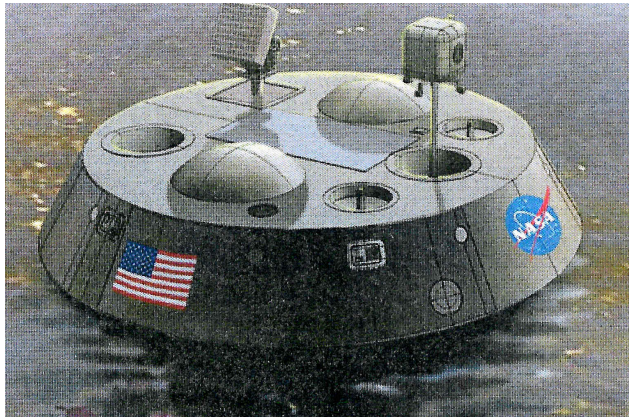


GEMS: GEophysical Monitoring Station
PI: Bruce Banerdt, JPL





TiME: Titan Mare Explorer
PI: Ellen Stofan, Proxmey VA



One of these missions will be selected for flight in the summer of 2012

New Frontiers Program

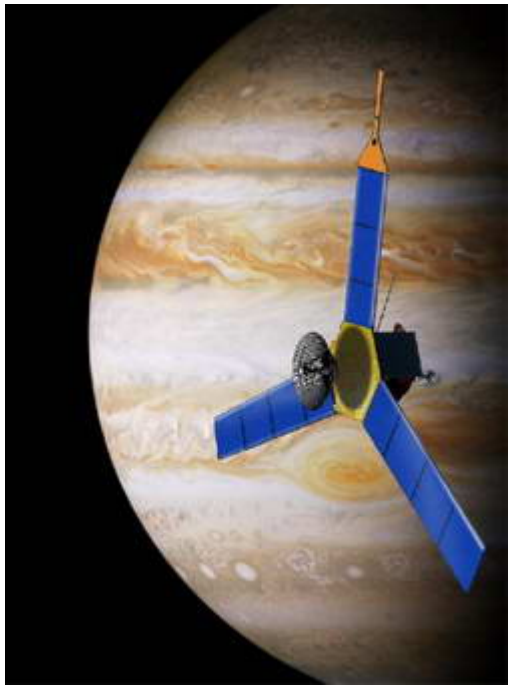
1st NF mission
New Horizons:

Pluto-Kuiper Belt

Launched January 2006
Arrives July 2015
PI: Alan Stern (SwRI-CO)

2nd NF mission
JUNO:

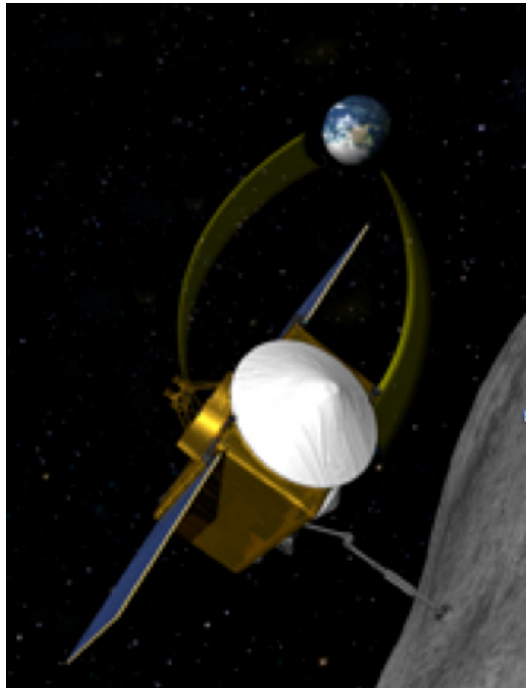
Jupiter Polar Orbiter



Launched August 2011
Arrives July 2016
PI: Scott Bolton (SwRI-TX)

3rd NF mission
OSIRIS-REx

Asteroid Sample Return



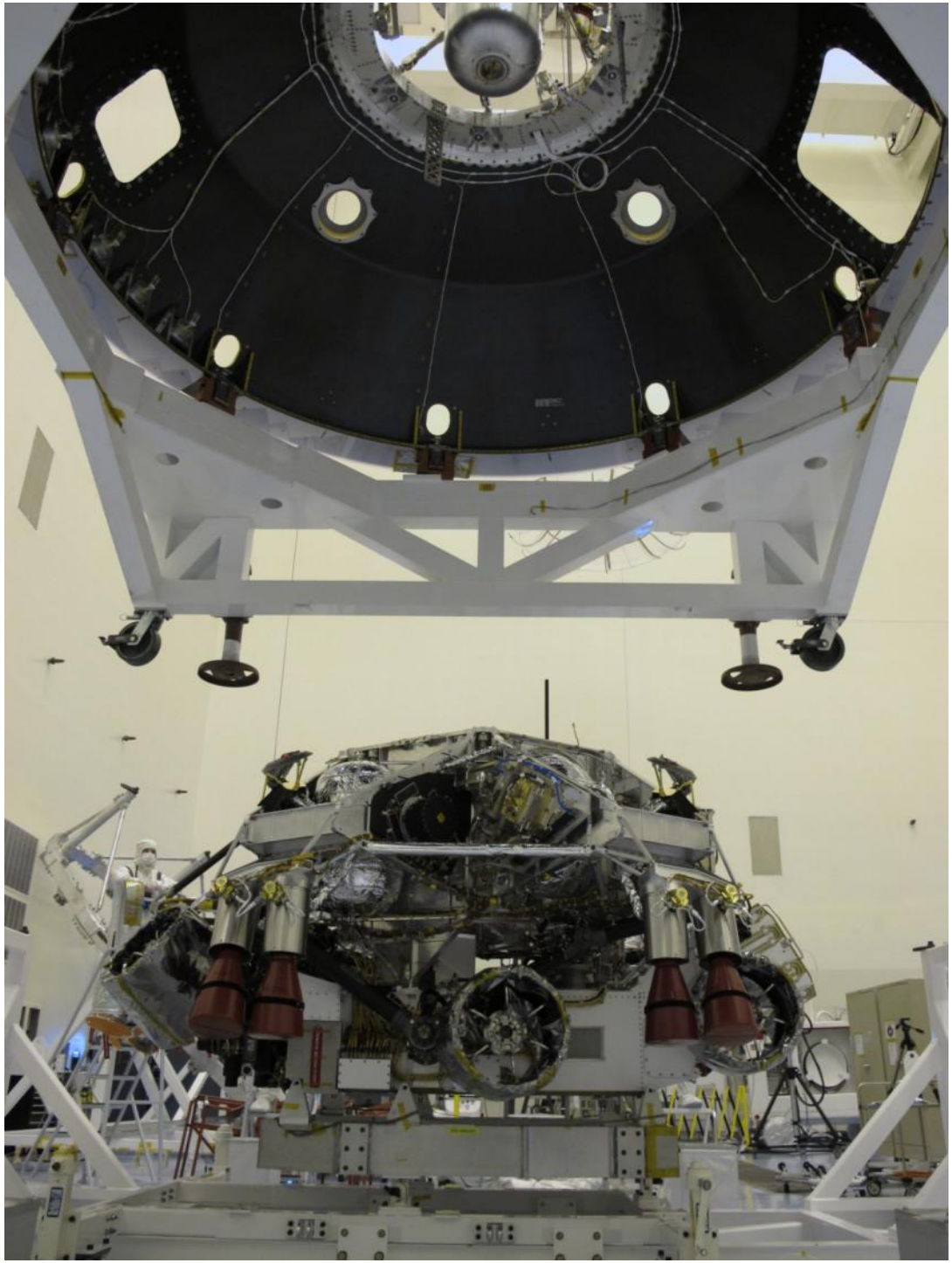
Sept. 2016 Launch
PI: Dante Lauretta (UA)

Selected


Powered
Descent
Vehicle
Mate
With Rover


242
EXIT
EXIT
ONLY
NOTICE

Backshell to Descent Vehicle Mate




CAUTION
Launch window begins on November 25th

Future of NASA's Planetary Science

Planetary Program Architecture

Recommended by the Planetary Decadal Survey

Large Missions ("Flagship"-scale)

"Recommended Program"
(budget increase for JEO new start)

1) Mars Astrobiology Explorer-Cacher – descoped
2) Jupiter Europa Orbiter (JEO) – descoped
3) Uranus Orbiter & Probe (UOP)
4/5) Enceladus Orbiter & Venus Climate Mission

"Cost Constrained Program"
(based on FY11 Request)

1) Mars Astrobiology Explorer-Cacher – descoped
2) Uranus Orbiter & Probe (UOP)

Example

"Less favorable" budget picture than assumed
(e.g., outyears in FY12 request)

Descope or delay Flagship mission

Discovery
$500M (FY15) cap/mission (exclusive of LV) and 24 mo. cadence for selection

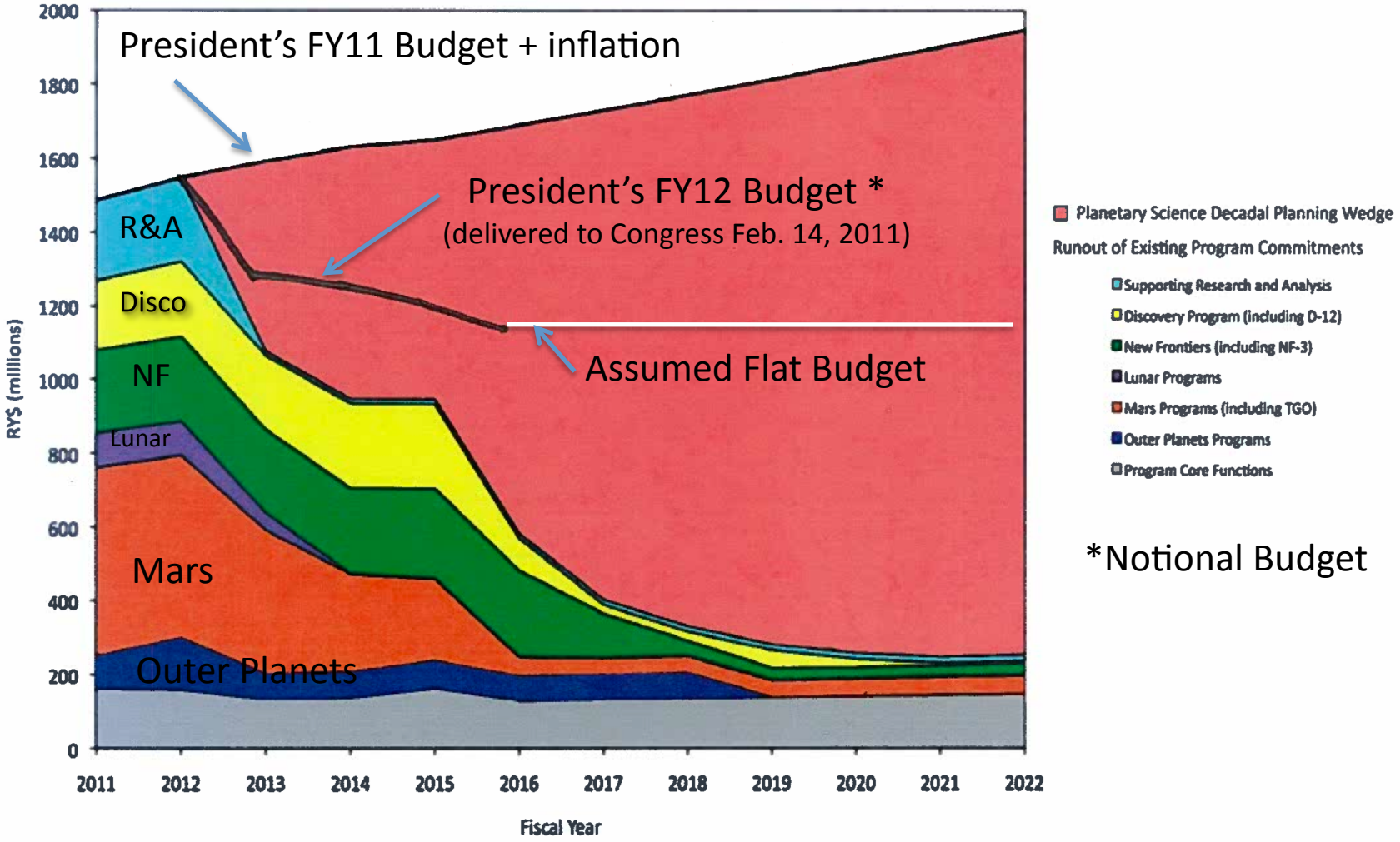
New Frontiers
$1B (FY15) cap per mission (exclusive of LV) with 2selections during 2013-22

Research & Analysis (5% above final FY11 amount then ~1.5%/yr)

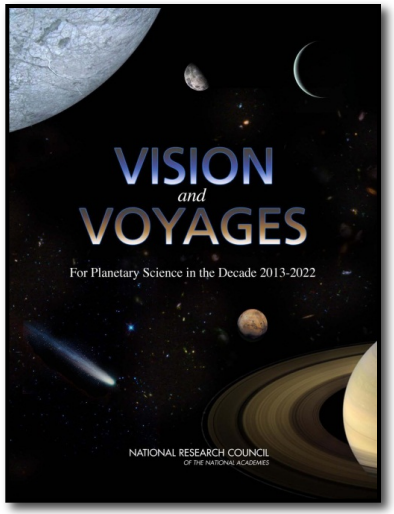
Technology Development (6-8%)

Current Commitments (ie: Operating Missions)

Planetary Funding Profiles
Issued Prior to the Planetary Decadal



*Notional Budget



Are you behind the Planetary Decadal?

DPS statement:

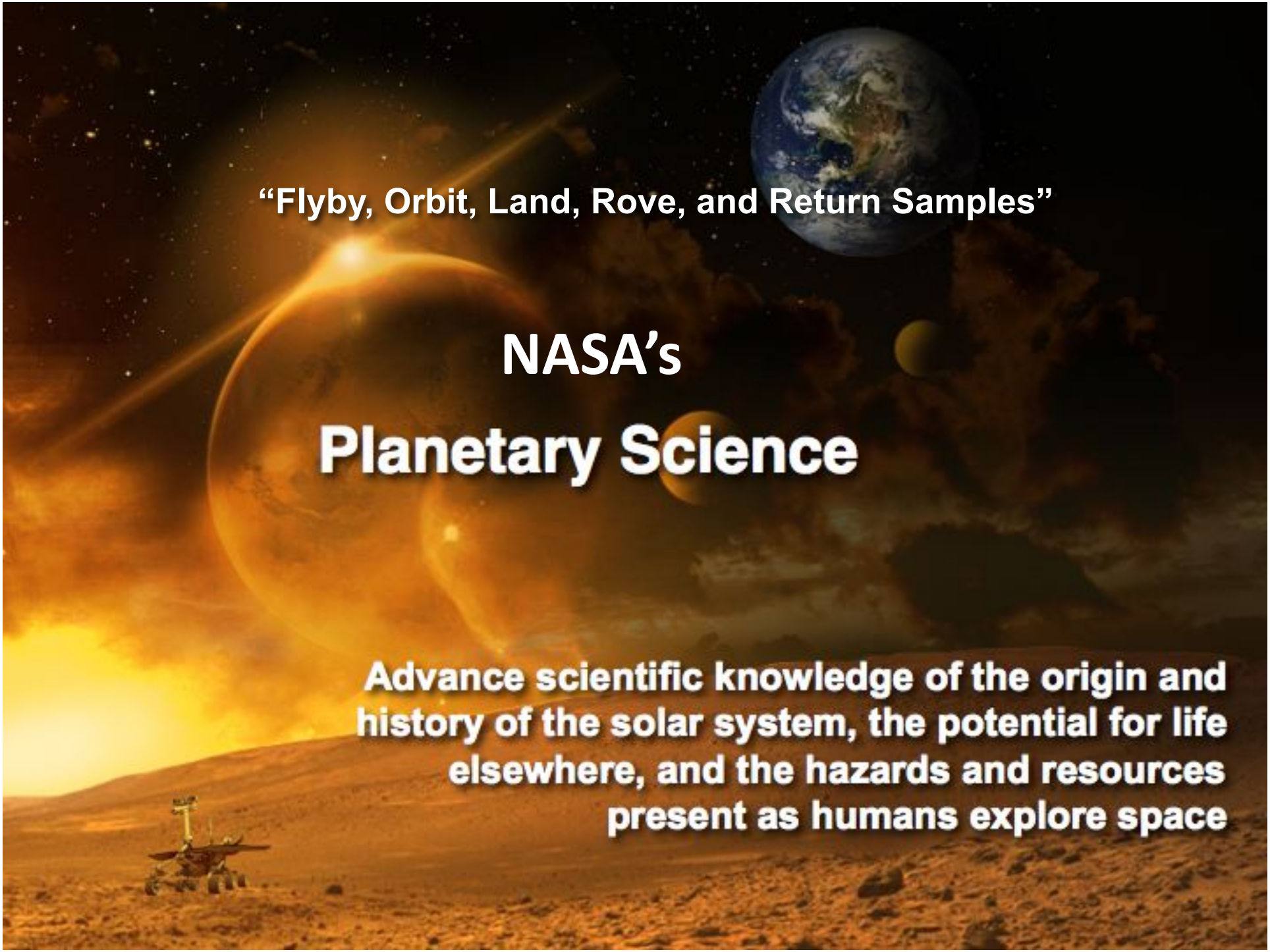
http://dps.aas.org/news/dps-statement-budget-activities

Future of Planetary Science

- Planetary Decadal just released lays out the next decade
  - It must have solid science community support !
- We are in the middle of a major revolution in the understanding of the origin and evolution of the solar system and if there is life beyond Earth
- Human exploration is depending on planetary science to lead the way in understanding the environment and hazards humans will face beyond low Earth orbit. – Moon, Asteroids, Mars
  - President Obama has stated that we will visit an asteroid by 2025 circle Mars in 2030 and that Mars was the ultimate destination
  - This makes planetary science a critical component to his National Space Policy
- The National Space Policy also stresses international cooperation on mutually beneficial space activities
  - ESA is putting in ~$1.2B (1B euros) for a new joint Mars Program with our support about the size of a New Frontiers program (also ~$1.4B)
- Utility: finding potentially hazardous objects that threaten the Earth
- We are constantly rewriting the textbooks.
  - If any one has the “inspiration factor” it’s got to be Planetary Science!

“Don’t react with *anger*
react with *vision*”

Former ESA Director of Science Roger Bonnet


"Flyby, Orbit, Land, Rove, and Return Samples"
NASA's
Planetary Science
Advance scientific knowledge of the origin and history of the solar system, the potential for life elsewhere, and the hazards and resources present as humans explore space